What Is Claimed Is:

1. An electrode material comprising compositions of $Li_{1+x}Ni_{\alpha}Mn_{\beta}A_{\gamma}O_2$ wherein A is chosen from the group consisting of Mg, Zn, Al, Co, Ga, B, Zr, Ti and further wherein x is between about 0 and 0.2, α is between about 0.1 and 0.5, β is between about 0.4 and 0.6, and γ is between about 0 and about 0.1.

2. The electrode material of claim 1, comprising a composition of $Li_{1+x}Ni_{\alpha}Mn_{\beta}O_2$, wherein x is between about 0 and 0.2, α is between about 0.2 and 0.5, and β is between about 0.5 and 0.6.

3. The electrode material of claim 1, wherein A is Mg and further wherein x is between about 0 and 0.2, α is between about 0.1 and 0.5, β between about 0.4 and 0.6, and γ is between about 0.01 and about 0.1.

4. The electrode material of claim 1, wherein A is Al and further wherein x is between about 0 and 0.2, α is between about 0.15 and 0.5, β is between about 0.45 and 0.6, and γ is between about 0.01 and about 0.1.

5. The electrode material of claim 1, wherein A is Co and further wherein x is between about 0 and 0.2, α is between about 0.15 and 0.5, β is between about 0.45 and 0.6, and γ is between about 0.01 and about 0.1.

6. The electrode material of claim 1, wherein A is Ti and further wherein x is between about 0 and 0.2, α is between about 0.2 and 0.5, the β is between about 0.4 and 0.6, and γ is between about 0.01 and about 0.1.

7. The electrode material of claim 1, wherein the material is manufactured by a solid state reaction method.

8. The electrode material of claim 7, wherein the materials are prepared by the steps of:

mixing amounts of lithium hydroxide (or lithium carbonate), (Ni,Mn)-hydroxide, and A-hydroxide or A oxide (wherein A is chosen from the group consisting of Mg, Zn, Al, Co, Ga, B, Zr, and Ti) in acetone using zirconia balls for about 12-24 hours to form a mixed powder;

calcining the mixed powder at about 450~550°C for about 12-30 hours in air;

calcining the mixed powder at about 900-1100°C for about 10-24 hours either in air or an nitrogen-oxygen atmosphere; and

quenching the calcined powders into liquid nitrogen.

9. The electrode material of claim 1, wherein the material is manufactured by an aqueous solution based process.

10. The electrode material of claim 9, wherein the materials are prepared by the steps of:

dissolving appropriate amounts of lithium hydroxide, nickel hydroxide, and A-hydroxide or A-nitrate (wherein A is chosen from the group consisting of Mg, Zn, Al, Co, and Ga) in distilled water whose pH is adjusted with nitric acid;

adding an aqueous solution of manganese acetate to form a mixed solution;

refluxing the mixed solution in a round bottom flask attached with a condenser at about 80°C for about 12-24 hours;

evaporating the mixed solution in a rotary vacuum evaporator;

eliminating the organic contents in the mixed solution at about 400°C for about 2 hours;

calcining the resulting powder at about 900-1100°C for about 10-24 hours in either air or an nitrogen-oxygen atmosphere; and

quenching the resulting powder into liquid nitrogen.

11. The electrode material of claim 1, wherein the material is manufactured by a sol-gel method.

12. The electrode material of claim 11, wherein the materials are prepared by the steps of:

dissolving appropriate amounts of lithium acetate, nickel acetate, manganese acetate, A-acetate or A-nitrate (wherein A is chosen from the group consisting of Mg, Zn, Al, Co, and Ga) in distilled water;

adding a glycolic/tartaric acid solution for use as a chelating agent;

adjusting the pH of the resulting solution to about 7 to about 8 using ammonium hydroxide;

continuously stirring and heating the solution on a hot plate to form a gel precursor;

decomposing the gel precursor at 450°C about for about 5h in air to form a decomposed powder;

firing the decomposed powders at about 900-1100°C for about 10-24 hours in either an air or an nitrogen-oxygen atmosphere; and

rapidly quenching the calcined powders into liquid nitrogen.

13. The electrode material of claim 1, wherein the electrode material is a cathode.

14. A method for forming an electrode material made of substituted lithium nickel-manganese oxides, comprising the steps of:
producing compositions of $Li_{1+x}Ni_{\alpha}Mn_{\beta}A_{\gamma}O_2$ wherein A is chosen from the group consisting of Mg, Zn, Al, Co, Ga, B, Zr, and Ti, and further wherein x is between about 0 and 0.2, α is between about 0.1 and 0.5, β between about 0.4 and 0.6, and γ between about 0 and about 0.1 through a electrode forming process chosen from the group consisting of a solid-state reaction method, an aqueous solution method, and a sol-gel method.

15. The method of claim 14, wherein the method of synthesis is the solid-state reaction method comprising the steps of:

mixing amounts of lithium hydroxide (or lithium carbonate), (Ni,Mn)-hydroxide, and A-hydroxide or A oxide (wherein A is chosen from the group consisting of Mg, Zn, Al, Co, Ga, B, Zr, and Ti) in acetone using zirconia balls for about 12-24 hours to form a mixed powder;

calcining the mixed powder at about 450~550°C for about 12-30 hours in air;

calcining the mixed powder at about 900-1100°C for about 10-24 hours either in an air or an nitrogen/oxygen atmosphere; and

rapidly quenching the calcined powders into liquid nitrogen.

16. The method of claim 14, wherein the method of synthesis is the aqueous solution method comprising the steps of:

dissolving appropriate amounts of lithium hydroxide, nickel hydroxide, and A-hydroxide or A-nitrate (wherein A is chosen from the group consisting of Mg, Zn, Al, Co, and Ga) in water;

adding an aqueous solution of manganese acetate to form a mixed solution;

refluxing the mixed solution in a round bottom flask attached with a condenser at about 80°C for about 12-24 hours;

evaporating the mixed solution in a rotary vacuum evaporator;

eliminating the organic contents in the mixed solution at about 400°C for about 2 hours;

calcining the resulting powder at about 900-1100°C for about 10-24 hours in either an air or an nitrogen/oxygen atmosphere; and

rapidly quenching the calcined powders into liquid nitrogen.

17. The method of claim 14, wherein the method of synthesis is the sol-gel method comprising the steps of:

dissolving appropriate amounts of lithium acetate, nickel acetate, manganese acetate, A-acetate or A-nitrate; (wherein A is chosen from the group consisting of Mg, Zn, Al, Co, and Ga) in water;

adding a glycolic/tartaric acid solution for use as a chelating agent;

adjusting the pH of the resulting solution to about 7 to about 8 using ammonium hydroxide;

continuously stirring and heating the solution on a hot plate to form a gel precursor;

decomposing the gel precursor at 450°C about for about 5h in air to form a decomposed powder;

calcining the decomposed powders at about 900-1100°C for about 10-24 hours in either an air or an nitrogen/oxygen atmosphere; and

rapidly quenching the calcined powders into liquid nitrogen.

18. An electronic device comprising:

an electrode comprised of an electrode material having the formula $Li_{1+x}Ni_{\alpha}Mn_{\beta}A_{\gamma}O_2$ wherein A is chosen from the group consisting of Mg, Zn, Al, Co, Ga, B, Zr, and Ti and further wherein x is between about 0 and about 0.2, α is between about 0.1 and about 0.5, β is between about 0.4 and about 0.6, and γ is between about 0 and about 0.1.

19. The electronic device of claim 18, wherein the electronic device comprises a rechargeable battery.

20. The electronic device of claim 18, wherein the electrode is a cathode comprising a mixture of about 80 wt.% of the electrode material, about 10 wt.% carbon, and about 10 wt.% Polyvinylidene fluoride as a binder.